This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
## A INVESTIGATION FRACTIONS WITHIN FRACTIONS

### 1 (a)

\[
\frac{1}{1+\frac{2}{3}} 
\]

seen

1

### 1 (b)

\[
\frac{1}{1+\frac{3}{5}} 
\]

seen

1 C opportunity

### 1 (c)

<table>
<thead>
<tr>
<th>(\frac{1}{1})</th>
<th>(\frac{1}{2})</th>
<th>(\frac{2}{3})</th>
<th>(\frac{3}{5})</th>
<th>(\frac{5}{8})</th>
<th>(\frac{8}{13})</th>
<th>(\frac{13}{21})</th>
<th>(\frac{21}{34})</th>
</tr>
</thead>
</table>

2 B1 each

### 1 (d)

[Numerator =] denominator of 7th or previous fraction or added the two previous numerators oe or denominator of (previous term + 1) oe

[Denominator =] numerator + denominator of 7th or previous fraction or added the two previous denominators oe or numerator of (previous term + 1) oe

2 B1 each

### 2 (a)

\[
\frac{10}{11} 
\]

22

\[
\frac{22}{21} 
\]

2 B1 each

FT their \(\frac{10}{11}\)

C opportunity

### 2 (b)

[Numerator =] \(2 \times\) previous denominator or \(2 \times 11 = 22\) or previous numerator + \(2 \times\) numerator before previous numerator.

[Denominator =] numerator + denominator of previous fraction or \(10 + 11 = 21\) or previous denominator + \(2 \times\) denominator before previous denominator.

2 B1 each
3 (a) (i) \(x(1 + x) = 1\) seen

(ii) 0.618[0…] 1 C opportunity

(iii) 
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>8</th>
<th>13</th>
<th>21</th>
<th>34</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
<td>0.67</td>
<td>0.6</td>
<td>0.625</td>
<td>0.615</td>
<td>0.6153</td>
<td>0.6154</td>
<td>0.618 or 0.6176[…]</td>
<td></td>
</tr>
</tbody>
</table>

(b) (i) 
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
<th>6</th>
<th>10</th>
<th>11</th>
<th>22</th>
<th>21</th>
<th>42</th>
<th>43</th>
<th>86</th>
<th>85</th>
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<tbody>
<tr>
<td>2</td>
<td>0.667</td>
<td>1.2</td>
<td>0.909</td>
<td>0.909</td>
<td>1.048</td>
<td>1.0476[…]</td>
<td>0.977</td>
<td>1.012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(ii) \([x =] 1\) 1 C opportunity

(iii) The decimals in part (i) are getting closer to the answer in part (ii) oe

(c) (i) \(-\frac{1 + \sqrt{1 + 4N}}{2}\) oe

(ii) Any three of \([N =] 2, 6, 12, 20, 30, 42, \text{etc.}\) 1 C opportunity

Communication seen in 3 or more of 1(b), 2(a), 3(a)(ii), 3(b)(ii), 3(c)(ii) 2 C1 for two
### B MODELLING  
**FITNESS TRAINING**

1. (a)  
   \[ 1.5 \div \frac{20}{60} \text{ oe} \]  
   1

(b) 18  
   1 C opportunity

(c) [Day] 5  
   1

2. 2.7 [km] or 2700 m  
   1 C opportunity

3. (a)  
   \[ D = \frac{6.4x}{60} + 8.1 \left(1 - \frac{x}{60}\right) \text{ or } \frac{6.4x + 8.1(60-x)}{60} \]  
   or \[ \frac{6.4x + 8.1(60-x)}{60} \]  
   soi  
   1

(b)  
   \[ D = \frac{6.4x + 486 - 8.1x}{60} \text{ oe} \]  
   1 dep. on 3(a)

(c)  
   ![Graph of Distance vs Time](image)
   \[ \text{B1 Correct line approximately with negative gradient} \]

(d) 7.25 [km]  
   1 C opportunity

(e) 12.5 [km/h]  
   1 C opportunity

(f) (i)  
   \[ D = \frac{6.4x}{60} + \frac{8.1y}{60} + 12.5 \left(1 - \frac{x}{60} - \frac{y}{60}\right) \text{ oe isw} \]  
   1FT FT their (e)

(ii)  
   \[ D = \frac{1}{60} (6.4x + 8.1y + 750 - 12.5x - 12.5y) \text{ soi www} \]  
   1 dep on (f)(i)

(g) (i)  
   \[ D = \frac{1}{60} (750 - 6.1n - 4.4n) \text{ oe isw} \]  
   1 If 0 scored then FT their correct (f)(i)

(ii)  
   ![Graph of Distance vs Time](image)
   \[ \text{B1 for line from 12.5 with negative gradient} \]
   \[ \text{B1 dependent for (30, 7.25)} \]
### Mark Scheme

**IGCSE – May/June 2014**

| (iii) | Running or No walking and/or jogging | 1 |
| (iv) | No running or Walking and/or jogging | 1 |
| (v)  | \[ D = \frac{1}{60} (486H - 1.7x) \text{ or } \frac{6.4x}{60} + 8.1 \left( \frac{H - x}{60} \right) \text{ oe} \]  
  \[ D = \frac{1}{60} (750H - 6.1x - 4.4y) \text{ or } \]  
  \[ \frac{6.4x}{60} + \frac{8.1y}{60} + 12.5 \left( \frac{H - x - y}{60} \right) \text{ oe} \] | 2 | B1 for each |

Communication seen in 3 from 1(b), 2, 3(d), 3(e) | C2 | C1 for one |